

REMARKS

Reconsideration of this application is respectfully requested in view of the remarks below.

STATUS OF CLAIMS

Claims 1-20 are pending in this application. Claims 5 and 20 are objected to as being dependent upon a rejected base claim; claim 13 is also believed to have been indicated to contain allowable subject matter, based upon the statement in paragraph 5 of the Office action dated December 17, 2007, and the statement in paragraph 1 of the Office action dated July 2, 2008. Applicants appreciate these indications of allowability. For the reasons given below, Applicants respectfully submit that all of the claims are allowable.

ANTICIPATION REJECTION

In paragraph 2 of the Office action dated July 2, 2008, the Examiner has rejected claims 1-4, 9-12, 14-15, and 17-19 under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,985,200 (Miyachi). Applicants respectfully traverse this rejection for the reasons given below.

1. Declaration under 37 C.F.R. § 1.131

First, under 35 U.S.C. § 102(e), Miyachi is entitled to an effective date as a reference of October 7, 2003. Applicants submit herewith a Declaration under 37 C.F.R. § 1.131 by the inventors that establishes that the inventors invented the claimed subject matter prior to this October 7, 2003 effective date. As a result, Miyachi is not available as a reference against Applicants' claims, and this rejection should be withdrawn.

More specifically, the Declaration establishes the actual reduction to practice of liquid crystal devices falling within the scope of Applicants' claims prior to October 7, 2003. The Declaration shows that polymeric materials that function as a surface alignment layer were synthesized and assembled into liquid crystal cells by combining with a liquid crystal bulk layer, and that these liquid crystal cells were demonstrated to be controllable by an electric field, all prior to October 7, 2003.

In addition, the Declaration also establishes that the invention of Applicants' claims was conceived prior to October 7, 2003, and prepared into a draft patent application, and that this patent application was diligently revised and prepared for filing from a date just prior to October 7, 2003, until filing as a priority application on November 18, 2003.

Either of these showings is more than sufficient to establish a date of invention prior to the October 7, 2003 effective date of Miyachi, and therefore to render Miyachi unavailable as a reference against Applicants' claims. Accordingly, this rejection should be withdrawn.

2. Lack of Anticipation

Even if Miyachi were available as a reference, it still does not anticipate Applicants' claims. As Applicants have previously indicated, the claims recite that the surface-director alignment layer is directly controllable by an electric field by dielectric coupling. This feature is neither disclosed in, nor desirable for, the system disclosed by Miyachi.

In dielectric coupling of a molecule to an applied electric field, the director of the molecule (i.e., the long axis of a molecule of a layer with positive dielectric anisotropy, or the short axis of a molecule of a layer with negative dielectric

anisotropy) aligns to the field lines of the electric field. In dielectric coupling, it is not possible for a molecule to turn or twist around the field lines of the applied electric field.

The electrodes of the system disclosed by Miyachi are arranged such that the electric field crosses the first and second switching layers and the liquid crystal cell, as indicated in Figure 1 of Miyachi. As a result, the molecules in the switching layers twist around the field lines of the electric field. Applicants respectfully submit that this is only possible in situations where ferroelectric coupling, ferrielectric coupling, or antiferroelectric coupling is the mechanism of operation, and is not possible where dielectric coupling is the mechanism of operation.

Applicants respectfully submit that Miyachi does not disclose dielectric coupling between the switching layers and the applied electric field; the behavior of the switching field disclosed in Miyachi is impossible to achieve with dielectric coupling.

In addition, Miyachi discloses that each of the molecules in the first or second switching layers, and an associated molecule in the other switching layer, behave as enantiomers. See claim 1 of Miyachi, and the specification of Miyachi at column 5, lines 41-57. As a result, these layers switch in mutually opposite directions. See Miyachi at column 5, lines 25-27. Applicants submit that this is inconsistent with the term "dielectric coupling" as it is used in the present application. The present application describes dielectric coupling as giving rise to an electro-optic response that is quadratic with the applied field, i.e., that is independent of field polarity. As a result, dielectric coupling can only be used to control the relationship between the orientation before and after the switching, but not the direction in which the molecule

turns in order to switch from one orientation to another. Applicants submit that this is yet another express teaching in Miyachi that is incompatible with the presence of dielectric coupling: the teaching that the molecules in the first and second switching layers of Miyachi turn in mutually opposite directions.

Finally, Applicants submit that the Examiner's contention that this opposite direction of switching indicates that the first and second switching layers of Miyachi are of opposite dielectric anisotropy is erroneous. As Applicants have explained, the functioning of the switching layers is due to ferro-, ferri-, or antiferroelectric coupling, i.e., due to chirality in the liquid crystal phase of the switching layer. Ferro-, ferri-, and antiferroelectric liquid crystal layers behave as enantiomers as disclosed in Miyachi because they have opposite chirality, so that the cholesteric layer has opposite handedness. This is completely independent of the sign of the dielectric anisotropy of the molecules, and the Examiner's inference that direction of switching implies opposite-signed dielectric anisotropy is incorrect. If the Examiner is aware of some literature reference that links the two concepts in the manner suggested in the Office action, then such a reference should be made of record in this application so that it can be reviewed and addressed by Applicants.

Applicants respectfully submit that Miyachi fails to disclose a particular embodiment of a liquid crystal device having each of the features recited in Applicants' claims, arranged as recited in the claims. As a result, the Examiner has failed to establish that, even if Miyachi were available as a reference, it anticipates Applicants' claims. See *Net MoneyIN Inc. v. VeriSign Inc.*, Fed. Cir., No. 07-1565 (October 20, 2008); *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ

193 (Fed. Cir. 1983); *In re Arkley*, 455 F.2d 586, 172 USPQ 524 (CCPA 1972). As a result, this rejection should be withdrawn.

OBVIOUSNESS REJECTION

In paragraph 2 of the Office action dated July 2, 2008, the Examiner has rejected claims 6-8 and 16 under 35 U.S.C. § 103(a) as obvious over Miyachi in view of U.S. Patent No. 5,973,817 (Robinson). Applicants respectfully traverse this rejection for the reasons given below.

As indicated above, Miyachi is not available as a reference against Applicants' claims, and therefore cannot form the basis of an obviousness rejection under 35 U.S.C. § 103(a). Moreover, Robinson does not cure the deficiencies of Miyachi noted above. As a result, combination of Robinson with Miyachi does not establish a *prima facie* case of obviousness. In either case, this rejection should be withdrawn.

NOTIFICATION OF RELATED COPENDING APPLICATION

Applicants wish to bring to the Examiner's attention the existence of copending related application Serial No. 10/562,118, filed December 23, 2005, and any references cited therein.

CONCLUSION

Applicants respectfully submit that this application is in condition for immediate allowance, and an early notification to that effect is respectfully requested. If further issues remain to be resolved, the Examiner is requested to contact the undersigned to arrange for a telephonic or personal interview to expedite prosecution of this application.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: November 19, 2008

By: 

Bruce D. Gray

Registration No. 35799

P.O. Box 1404
Alexandria, VA 22313-1404
703 836 6620